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Report To The Congress

OF THE UNITED STATES

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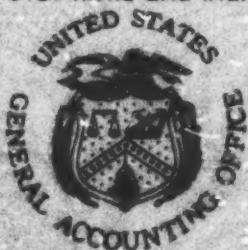
ORIGINAL

Evaluation Of Selected Features Of U.S. Nuclear Non-Proliferation Law And Policy

Because other nations now have uranium enrichment facilities, no nation can use nuclear fuel services to dictate actions to others. The United States, therefore, should avoid undue reliance on its uranium enrichment capability as a tool to prevent the spread of nuclear weapons.

The 1978 nuclear non-proliferation law requires the United States to ensure the availability of U.S. enrichment to meet foreign demand, but it is apparent that a new enrichment plant authorized in 1978 is needed to meet this demand.

The 1978 law appears to be administratively workable as a means of exercising control over nuclear exports, but more needs to be done to make Government reviews of nuclear exports predictable and timely. A comprehensive interagency reassessment is needed of the controls the Department of Energy administers over foreign activities of U.S. firms and individuals.



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COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

EVALUATION OF SELECTED
FEATURES OF U.S. NUCLEAR
NON-PROLIFERATION LAW AND
POLICY

D I G E S T

Recent changes in U.S. nuclear non-proliferation law and policy focus heavily on curbing the capability of nations to produce weapons-usable materials--plutonium and highly enriched uranium. 1/

Some nations are seeking energy security by developing their own nuclear fuel-cycle capabilities. The 1978 nuclear non-proliferation law, in combination with other congressional and executive branch policy initiatives, attempts to provide a balance of denials, controls, and incentives directed toward discouraging other nations from premature development of fuel-cycle capabilities that would provide independent access to plutonium and highly enriched uranium. (See p. 3 to 12.)

GAO evaluated selected features of U.S. nuclear non-proliferation law and policy aimed at curbing the proliferation risks of nuclear power as they related to the following questions.

Are uranium supplies
adequate to defer developing
reprocessing technologies and
breeder reactors?

No one knows how much uranium is or will be available or how much will be needed to meet future energy needs. National

1/Although plutonium and highly enriched uranium have benefits for the production of nuclear power, they are not essential to it, at least in the near term. In contrast, plutonium or highly enriched uranium are indispensable ingredients of nuclear weapons.

perceptions of ore availability appear to be derived after consideration of previously announced national nuclear strategies. Differing perceptions of the uncertainties in uranium supply and demand, coupled with political uncertainties that could affect its availability, appear sufficient to justify diametrically opposed nuclear power strategies. (See p. 26.)

Can the United States use
its enrichment capability
to promote non-proliferation?

U.S. nuclear cooperation policies have been predicated on the belief that the United States can use its dominant position in the international enrichment market to influence other nations to accept or adopt more stringent non-proliferation measures. With the emergence of foreign enrichment capabilities, the U.S. share of the market is diminishing. U.S. reliance on its uranium enrichment capability as a non-proliferation tool has therefore become an outdated and unrealistic idea.

The United States is committed to being a reliable supplier of enrichment services to nations adhering to effective non-proliferation policies. While the United States should continue to link the supply of enrichment services with the non-proliferation behavior of the recipients, future non-proliferation policies should recognize that the emergence of foreign uranium enrichment facilities means that no individual nation, including the United States, is in a position to use uranium enrichment services to dictate the actions of others.

Is more U.S. enrichment
capacity needed to meet
foreign demand?

From the standpoint of ensuring the availability of U.S. enrichment services to meet foreign demand--as required by the 1978 nuclear non-proliferation law--it is not apparent that construction of a new

enrichment plant is justified at this time. Circumstances have changed since a new plant was authorized in 1975 and decisions were made to use energy-efficient centrifuge technology in 1977. A slowdown in the growth of nuclear power and the emergence of foreign enrichment capabilities have created a "buyers market" for enrichment services. A worldwide glut in enrichment capacity is expected in the mid-1980s. DOE is operating its enrichment complex at about 40 percent of capacity and has delayed construction of 75 percent of the new enrichment capacity. (See p. 31.)

DOE believes that completing construction of the first increment of centrifuge capacity in 1989 is justified because it will enable DOE to meet projected increases in demand and to eventually replace certain high cost, energy-intensive diffusion capacity with more energy-efficient centrifuge capacity. GAO believes that DOE has not fully and objectively considered available options that would allow it to meet demand and delay the current construction program until more is known about advanced enrichment technologies under development. (See p. 44.)

The Secretary of Energy should, in future budget requests for the construction of uncommitted increments of enrichment capacity, specifically demonstrate that the

- need for the new capacity is based on realistic demand forecasts that cannot be met by DOE's recently upgraded existing facilities; or
- new capacity will further U.S. non-proliferation goals by enhancing U.S. reliability as a nuclear supplier and/or by providing a disincentive for other nations to acquire enrichment technologies; or
- new capacity is economically justified and the economic justification fully and objectively considered options involving the use of advanced enrichment technologies for the new capacity. (See p. 43.)

MATTERS FOR CONSIDERATION
BY THE CONGRESS

In view of changes in demand for enrichment services and the \$5.7 billion estimated cost of constructing the new enrichment plant first authorized by the Congress in December 1975, GAO believes the Congress should look very closely at executive branch requests for construction funding. The Department of Energy needs to develop and present sufficient documentation demonstrating that the additional capacity is needed. If convincing documentation is not presented, the Congress should consider not appropriating additional funds for construction of uncommitted increments. (See p. 42.)

How well are U.S. controls
over exports of nuclear
material and equipment working
to remove doubts about U.S.
reliability?

Foreign concerns over U.S. reliability as a nuclear trading partner generally center around U.S. non-proliferation policies, and delays and uncertainties associated with the nuclear export control system. If the United States is to remove doubts about its reliability, it must conduct non-proliferation reviews of nuclear material and equipment exports in a manner which allows for the predictable performance of commercial contracts. Although the 1978 nuclear non-proliferation law has proved to be an administratively workable means of exercising controls over nuclear exports, more needs to be done to make Government reviews more predictable and timely. For the most part, GAO believes that remedial actions can be taken within the constraints of the law. (See pp. 70 to 71.)

Commercial reprocessing in the United States has been "indefinitely deferred." Most major U.S. nuclear trading partners, however, view reprocessing as the best or only option

available to manage or use spent nuclear fuel. Several have contractual commitments with the only two countries offering reprocessing services for the international market--the United Kingdom and France. As a result there is substantial opposition to the requirements of the 1978 nuclear non-proliferation law which would extend U.S. rights to approve foreign reprocessing of U.S.-supplied nuclear fuel and to the way the United States exercises its reprocessing approval rights. (See pp. 54 to 62.)

The executive branch has not publicly clarified when the United States will claim reprocessing approval rights. The resulting uncertainty has been cited as a factor impeding acceptance of U.S. reprocessing approval rights by some European countries, and influencing decisions not to purchase U.S. supplies and services. (See pp. 55 to 57.)

The Secretary of State should announce the U.S. position on when the United States will claim reprocessing approval rights and clarify

- what happens when U.S. exports are "co-mingled" with exports of other nations,

- what happens when more than one nation claims approval rights on the same commodity, and

- whether the executive branch will condition component exports on reprocessing approval rights. (See p. 70.)

GAO believes the United States should continue its case-by-case review of nuclear arrangements involving reprocessing and plutonium use and strictly implement the 1978 nuclear non-proliferation law's standards governing U.S. approvals. Much of the foreign concern on how the United States exercises its reprocessing approval rights stems from executive branch policy of considering some foreign reprocessing requests

only as a "last resort" for the disposition of spent fuel. GAO believes the executive branch could remove much of the uncertainty about how U.S. reprocessing approval rights are exercised by considering and acting on foreign requests without trading partners having to demonstrate an imminent physical need (i.e. spent fuel congestion). (See pp. 61 and 62.)

The Secretary of Energy should seek the necessary top-level policy approvals to allow the executive branch to do this. (See pp. 71 and 72.)

GAO strongly endorses the administration's policy to reduce the enrichment levels of highly enriched uranium exports. However, the executive branch should, after appropriate consultations, decide and tell foreign governments which reactors merit continued supplies, and the quantity and the level of enriched fuel to be supplied. (See p. 68.)

The Secretary of State should improve the predictability of the export licensing process for highly enriched uranium by

- telling foreign governments after appropriate consultations which reactors merit continued supplies of highly enriched uranium pending commercial availability of more proliferation-resistant fuels, and
- expediting the executive branch processing of export requests for Presidential review. (See p. 71.)

How well are other forms
of U.S. assistance to
foreign nuclear programs
controlled?

A comprehensive interagency reassessment is needed of the controls the Department of Energy administers over nuclear technology exports and all other foreign nuclear activities of U.S. firms and individuals. (See p. 87.) These controls contain

significant loopholes and are not well coordinated with the controls the Nuclear Regulatory Commission and the Department of Commerce administer in the nuclear field. Further, the Department of Energy's administration of these controls provides too many opportunities for arbitrary executive branch decisions and no routine opportunities for public or congressional scrutiny. (See p. 76.)

The Secretary of Energy should take the lead in coordinating a comprehensive interagency reassessment of the controls over foreign nuclear activities of U.S. firms and individuals and how they are administered. (See p. 87.)

AGENCY COMMENTS

The Department of Energy believes that construction of the first increment of new enrichment capacity (25 percent of the authorized capacity) should proceed as planned based on considerations of both demand and cost savings. GAO is not convinced by DOE's justification and believes more information is needed before the Congress appropriates additional funds. (See p. 44 and app. III.) Further, although DOE does not disagree with GAO's recommendation for a comprehensive interagency reassessment of controls over U.S. activities in foreign nuclear programs, it does not acknowledge that there is cause for concern. GAO believes the problems it discovered are of serious concern. (See p. 68 and app. III.)

The Departments of State and Commerce, the Arms Control and Disarmament Agency, and the Nuclear Regulatory Commission also commented on this report. Their comments were mostly of a technical nature. Where appropriate the report was revised to note their position on certain matters. (See apps. IV to VII.)

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ABBREVIATIONS

ACDA	Arms Control and Disarmament Agency
AIS	advanced isotope separation
DOD	Department of Defense
DOE	Department of Energy
EURATOM	European Atomic Energy Community
GWe	gigawatts of electricity
IAEA	International Atomic Energy Agency
INFCE	International Nuclear Fuel Cycle Evaluation
LWR	light water reactor
MWe	megawatts of electricity
NEA	Nuclear Energy Agency
NNPA	Nuclear Non-Proliferation Act of 1978
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NRC	Nuclear Regulatory Commission
U308	refined uranium ore
UF6	uranium hexafluoride
SWU	separative work unit